

WHAT IS CLAIMED IS:

1. A semiconductor device manufacturing method for forming first and second oxide films having different thicknesses on a semiconductor, comprising steps of:

forming an oxidation resistance film on a second oxide film formation area;

forming a first oxide film on a first oxide film formation area;

removing the oxidation resistance film; and

forming a second oxide film on a second oxide film formation area.

2. A semiconductor device manufacturing method according to claim 1,

wherein the first oxide film serves as a gate oxide film of a first transistor, and the second oxide film serves as a gate oxide films of a second transistor.

3. A semiconductor device manufacturing method according to claim 2,

wherein the first transistor is formed on the first oxide film, and the second transistor is formed on the second oxide film,

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wherein the first oxide film is formed by performing thermal oxidization by using the oxidation resistant film as a mask, wherein the second oxide film is formed by performing thermal oxidization.

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4. A semiconductor device manufacturing method for forming first and second transistors on semiconductor first and second gate oxide films having different thickness, comprising steps of:

forming a device separation film on the semiconductor;

forming an oxide film on a first transistor formation area and a second transistor formation area by performing thermal oxidization using the device separation film as a mask;

forming an oxidation resistant film across the entire surface of the semiconductor;

removing the oxidation resistant film on the first transistor formation area by using a photoresist film as a mask;

removing the oxide film on the first transistor formation area;

forming a first oxide film by performing thermal oxidization by using the oxidation resistant film formed on the second transistor formation area as a mask;

removing the oxidation resistant film and the oxide film

on the second transistor formation area;

forming a second oxide film on the second transistor formation area by performing thermal oxidization.

5 5. A semiconductor device manufacturing method according to claim 4,

wherein a high-voltage MOS transistor is formed on the first gate oxide film thicker than the second gate oxide film,

10 wherein a normal-voltage MOS transistor is formed on the second gate oxide film.

6. A semiconductor device manufacturing method according to claim 4,

15 wherein the surface of the semiconductor is not exposed when the photoresist film is used as a mask.

Q3 7. A semiconductor device manufacturing method according to claim 4, wherein the step of forming a first transistor includes steps of:

20 forming an opposite conductive source/drain layer having a low concentration by an ion implantation of an opposite conductive impurity into the semiconductor of one conductive type;

forming an opposite conductive source/drain layer having

a high concentration in the opposite conductive source/drain layer having the low concentration by the ion implantation of an opposite conductive impurity into the semiconductor;

forming a semiconductor layer of one conductive type that serves as a channel and is located between the opposite conductive source/drain layers; and

forming a first gate electrode on the semiconductor via the first gate oxide film.

8. A semiconductor device manufacturing method according to claim 7, /

wherein the opposite conductive source/drain layer having a low concentration is formed so that, at the least, the opposite conductive source/drain layer contacts the semiconductor layer that is formed below the gate electrode using an ion implantation method.

9. A semiconductor device manufacturing method according to claim 7, /

wherein the opposite conductive source/drain layer having a low concentration is formed and extended at a small depth in the surface layer of the semiconductor, so that, at the least, the opposite conductive source/drain layer contacts the semiconductor layer that is formed below the gate electrode

using an ion implantation method.

10. A semiconductor device manufacturing method according to claim 4 further comprising a step of forming the first transistor after forming the first gate oxide film, including steps of:

forming an opposite conductive source/drain layer having a low concentration by an ion implantation of an opposite conductive impurity into the semiconductor of one conductive type;

forming an opposite conductive source/drain layer having a high concentration in the opposite conductive source/drain layer having the low concentration by the ion implantation of an opposite conductive impurity into the semiconductor; and

forming a first gate electrode on the semiconductor via the first gate oxide film.

11. A semiconductor device manufacturing method according to claim 4 further comprising a step of forming the first transistor after forming the first gate oxide film, including steps of:

forming an first impurity layers having a low concentration by an ion implantation of an opposite conductive impurity into

two portions of the semiconductor of one conductive type;

forming a second impurity layer having a low concentration by an ion implantation of an opposite conductive impurity to connect the first opposite conductive impurity layers;

5 forming a third impurity layer having a high concentration by an ion implantation of an opposite conductive impurity in the first opposite conductive impurity layer;

10 forming a fourth impurity layer by an ion implantation of an one conductive impurity to divide the second impurity layer;

forming a first gate electrode on the semiconductor including the fourth impurity layer via the first gate oxide film.

15 12. A semiconductor manufacturing method according to claim 11,

wherein the second impurity layer is thinner than the first impurity layer.